PLAN OF STUDY
DELINEATION OF WATERS OF THE U.S.
Ballard Mine Project
Caribou County, Idaho

Prepared for:

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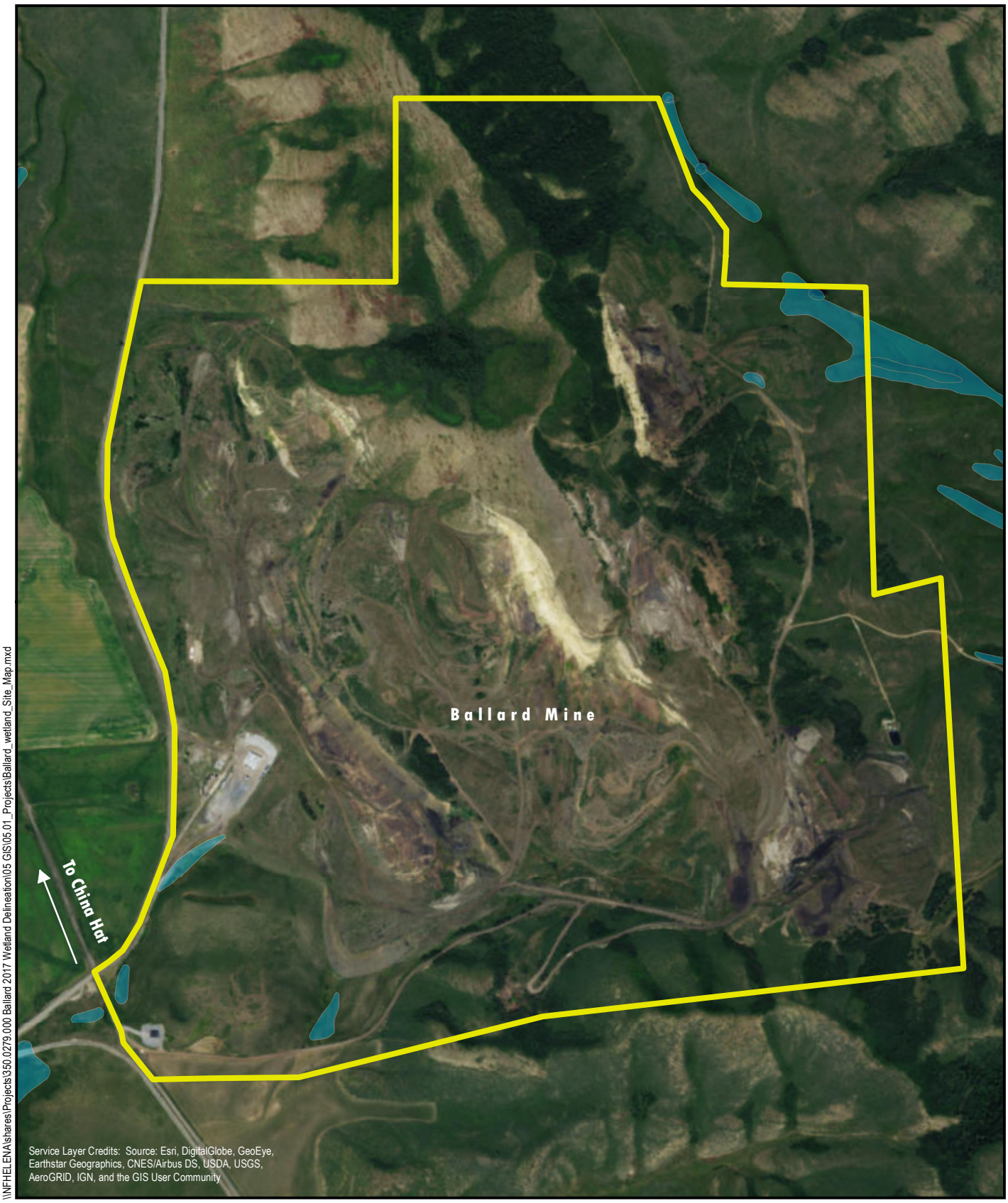
1.0 INTRODUCTION

P4 Production, LLC (P4), a subsidiary of Monsanto Company (Monsanto), is conducting various activities at the Ballard Mine Project located approximately 12 miles north of Soda Springs, Idaho, including a Remedial Investigation and Feasibility Study (RI/FS) consistent with the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The Ballard Mine operated from 1952 to 1969.

P4 has requested that NewFields Companies, LLC (NewFields) conduct a routine wetland delineation on the approximately 1,150-acre Ballard Mine site (**Figure 1**). NewFields identified the study area shown on **Figure 1** to include all areas of existing and future ground disturbance associated with mining and remediation, and anticipating that roadwork might also be required for the access road in the southern portion of the study area.

This Plan of Study (POS) includes two general tasks that are described in **Section 3.0**: Task 1 – Delineation of Waters of the U.S., including wetlands; and Task 2 – Watershed Study. Regulatory guidance is described in **Section 2.0**, and references are listed in **Section 4.0**.



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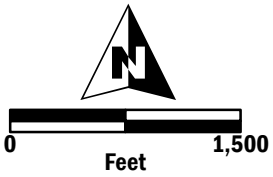

Ballard Study Boundary

NWI Wetlands

NewFields

Site Study Map
Ballard Mine Wetland Delineation
Caribou County, Idaho
FIGURE 1

2.0 REGULATORY GUIDANCE

The U.S. Army Corps of Engineers (COE), Under Section 404 of the Clean Water Act (CWA), must authorize actions requiring placing dredged or fill material into waters of the U.S. (WOTUS), including wetlands. Activities in wetlands and other WOTUS for which permits are required include, but are not limited to:

- Placement of fill;
- Ditching activities when the excavated material is side-cast;
- Levee and dike construction;
- Mechanized land clearing;
- Land leveling;
- Road construction; and
- Dam construction.

For jurisdictional purposes, wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3, 40 CFR 230.3).

The COE wetland delineation method in the "Wetland Delineation Manual" (Environmental Laboratory 1987) specifies that jurisdictional wetlands must meet the criteria for hydric soil, hydrophytic vegetation, and hydrology. The criteria for meeting these conditions is described in **Section 3.0**.

The determination as to the need for a Section 404 permit is based on an assessment of whether jurisdictional WOTUS would be affected by the proposed action. The determination of jurisdiction is made by the COE and in some cases jointly with EPA and may require a site-specific analysis by agency personnel. Typically, a jurisdictional determination (JD) is facilitated if the project sponsor provides site-specific information that includes wetlands delineation, assessment of a significant nexus with a navigable water, stream flow data, maps, and photographs.

A Regulatory Guidance Letter (June 5, 2007), issued by the COE addresses "Practices for Documenting Jurisdiction under Sections 9 & 10 of the Rivers and Harbors Act (RHA) and Section 404 of the Clean Water Act". This Guidance Letter and other policy direction resulted from the U.S. Supreme Court Decision; Rapanos vs. United States. Among the classes of water bodies subject to jurisdiction are: traditional navigable waters; wetlands adjacent to traditional navigable waters; non-navigable tributaries of traditional navigable waters that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally); and wetlands that directly abut such relatively permanent tributaries. Federal CWA jurisdiction also includes the following classes of water when an analysis determines that those waters have a significant nexus with a traditional navigable water: non-navigable tributaries that do not typically flow year-round or have a continuous flow at least seasonally; wetlands adjacent to such tributaries; and wetlands adjacent to but do not directly abut a relatively permanent non-navigable tributary.

A significant nexus exists if the tributary, together with its adjacent wetlands, has more than an insubstantial or speculative effect on chemical, physical, and/or biological integrity of downstream traditional navigable water. Principle considerations when evaluating significant nexus include the volume, duration, and frequency of flow of water in the tributary; proximity of the tributary to traditional navigable water; and the functions performed by the tributary and associated wetlands. Additional guidance concerning jurisdictional determination is addressed in a June 26, 2008 COE Regulatory Guidance Letter. This guidance letter explains the differences between a "preliminary JD" and "approved JD".

A regulatory guidance letter from the U.S. Environmental Protection Agency (EPA) and the COE (December 2, 2008), provides additional guidance on implementing the Supreme Court's decisions on the consolidated cases of Rapanos vs. United States and Carabell vs. United States. This letter provides guidance for determining water that likely would be regulated under the CWA and provides specific information on non-navigable tributaries and a nexus evaluation with interstate water.

3.0 PLAN OF STUDY

This section describes methods that will be conducted to complete the following two tasks at the Ballard Mine site: Task 1 – Delineation of Waters of the U.S.; and Task 2 – Watershed Study. This section also describes project reporting, schedule, and personnel.

3.1 TASK 1 – DELINEATION OF WATERS OF THE U.S.

NewFields will complete a delineation of WOTUS, including wetlands and non-wetland features, within the 1,150-acre study area. The following specific activities will be conducted:

- Obtain and evaluate available baseline data (e.g., aerial photographs, topography, soil survey, vegetation survey, National Wetland Inventory (NWI), etc.).
- Conduct routine wetland delineation of the 1,150-acre Ballard Mine study area in accordance with COE methodology. This will include collection of three-parameter data points to identify wetland features and non-wetland WOTUS. The 3-parameter data points and boundaries of WOTUS will be recorded using a sub-meter GPS unit.
- Characterize drainages as potential non-wetland WOTUS features, including defined channels (bed, bank, and ordinary high water mark) and connectivity to Traditional Navigable Waters (TNW). Any ditches, ponds, and springs within the study area will also be identified and characterized.

Prior to conducting fieldwork to identify and delineate wetlands, NWI maps and aerial imagery will be examined to determine potential locations of wetlands in and adjacent to the Study Area. Potential wetlands can also be identified from U.S. Geological Survey (USGS) quadrangle maps that show topography, drainages, and springs. The location and juxtaposition of wetlands adjacent to the Study Area is important in assessing if wetlands are adjacent to a Relatively Permanent Water (RPW) or have a significant nexus with a TNW.

Wetlands will be delineated following methodologies presented in the "Corps of Engineers Wetlands Delineation Manual" (Environmental Laboratory 1987) and the "Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region" (COE 2010). When identified in the field, wetland areas will be mapped by walking the boundaries with a GPS unit to establish polygons from which areas can be calculated.

The COE wetland delineation methodology prescribes data collection to identify whether the area in question meets the three-parameter criteria of hydric soil, hydrophytic vegetation, and wetland hydrology. Hydric soil is defined as "soil that is saturated, flooded, or ponded long enough during each growing season to develop anaerobic conditions in the upper part of the soil profile". Hydric soil exhibits characteristics that can be observed in the field including: high organic content, accumulation of sulfides, grey or reduced color, mottling, and low chroma.

Wetland hydrology is present when the soil is inundated or saturated within the major portion of the root zone (within 12 inches of the surface) during all or part of the growing season. Indicators of wetland

hydrology can be seen on the surface (e.g., surface water, water marks or algal matting), and can be observed in the soils (e.g., saturation, hydrogen sulfide odor, and oxidized root channels). Areas where both hydric soils and wetland hydrology occur are often, but not always, vegetated by hydrophytic vegetation. Each data-point will be located using GPS.

Hydrophytic vegetation is physiologically and morphologically adapted to saturated, anaerobic soil conditions that exist in wetlands. The COE has determined the estimated probability of each plant species occurrence in wetlands and has assigned an indicator status. Indicator classifications are: obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and upland (UPL) (**Table 1**). Wetland indicator status of plants encountered in wetlands will be determined by reference to the National List of Plant Species that Occur in Wetlands: Northwest - Region 9 (USFWS 1988) and USDA PLANTS (http://plants.usda.gov/java/).

For wetlands in the study area, observations related to wetland proximity to TNWs will be documented. These observations relate to whether wetland features directly abut non-navigable tributaries of TNWs, are located adjacent to other wetlands that directly abut relatively permanent waters, or seem to have no connection to tributaries of TNWs. An ecological relationship between tributaries and their adjacent wetlands in many cases supports a closely linked role ("significant nexus") in protecting the chemical, physical, and biological integrity of a downstream TNW.

The assessment of significant nexus with a TNW will be determined through aerial imagery interpretation, NWI maps, and field observations to determine if wetlands in the Study Area appear to have a nexus or connection with major streams in the area and the Blackfoot River. The Blackfoot River flows into the Snake River, a TNW.

Principal considerations when evaluating significant nexus include the volume, duration, and frequency of flow of water in the tributary, and the proximity of the tributary to a TNW. Physical indicators of flow may include the presence and characteristics of a reliable ordinary high water mark (OHWM) with a channel defined with evidence of scour and deposition and by bed and banks. Other physical indicators of flow may include shelving, wracking, water staining, sediment sorting, and scour. The COE will also consider certain relevant contextual factors that directly influence the hydrology of tributaries, including the size of a tributary's watershed, average annual rainfall, average annual snowpack, slope, and channel dimensions. Soil substrate and geologic landform (e.g., alluvial fan), and their potential to allow subsurface flow is also considered in the significant nexus evaluation.

Wetlands and non-wetland WOTUS with no significant nexus are considered "isolated" and typically non-jurisdictional. Erosional features (e.g., gullies, rills, and small washes characterized by low volume, infrequent, or short duration flow) are generally not considered by the COE to be jurisdictional WOTUS. Each feature observed will be mapped and labeled as a "potential WOTUS" with discussion in the report related to any observed connection to a TNW so that the COE can use the report to support its JD.

Table 1 Plant Indicator Definitions		
Indicator Symbol	**Indicator Status**	**Definition**
OBL	Obligate	Species that occur almost always (probability >99%) in wetlands under natural conditions.
FACW	Facultative wetland	Species that usually occur in wetlands (probability 67 to 99%), but occasionally found in non-wetlands.
FAC	Facultative	Species that are equally likely to occur in wetlands and non-wetlands (probability 33 to 66%).
FACU	Facultative upland	Species that usually occur in non-wetlands (probability 67 to 99%), but occasionally found in wetlands
UPL	Upland	Species that occur almost always in non-wetlands under normal conditions (probability >99%).
NI	No indicator	Species for which insufficient information was available to determine indicator status.

Source: Environmental Laboratory 1987.
Note: % = percent.

3.2 TASK 2 – WATERSHED STUDY

In addition to delineating WOTUS in the study area as described under Task 1, NewFields will conduct additional desktop and field studies to characterize the overall watershed. This information can be used by P4 to assess runoff and water management for the project site. Additional studies to be completed by NewFields for Task 2 include the following:

- Delineate sub-watershed areas and boundaries within and adjacent to the study area.
- Determine runoff directions and receiving waters for the sub-watersheds, including topographic depressions where water runoff collects.
- Characterize other water resources that may be in the study area, including springs, ponds, and ditches.
- Characterize general vegetation and soil types to allow calculation of runoff curve numbers; this information will be obtained from P4, agency sources, and/or on-site reconnaissance, as available.
- Measure or estimate flow rate for any streams and springs in the study area, and evaluate the potential seasonality of flow (i.e., ephemeral, intermittent, or perennial).

3.3 REPORTING AND SCHEDULE

After completion of fieldwork described above for Tasks 1 and 2, NewFields will prepare a Delineation Report for wetlands and non-wetland WOTUS within the Ballard Mine study area. The Delineation Report will contain background and site information, methods, results, and discussion. Three-parameter data sheets, delineation map(s), flow measurements, and representative photographs will be included in report appendices. In addition to showing delineated wetlands, the map(s) will indicate locations of other hydrologic features, including drainages, springs, ponds, ditches, watershed boundaries, and runoff directions. The report will also include documentation of the connectivity of observed waters to TNW for each mapped wetland and non-wetland WOTUS observed in the study area. GPS files containing data points and wetland boundaries will be included on a CD with the Delineation Report.

Field work for this project is currently scheduled for the week of July 10-15, 2017. A draft delineation report will be submitted to P4 for review and comment within 3 weeks of completing the fieldwork for Tasks 1 and 2. Following P4 review, the report will be finalized and the necessary electronic and/or hard copies will be compiled and delivered as requested.

3.4 PERSONNEL

The following staff from NewFields will complete the work described in this Plan of Study:

Julian Colescott, M.S., PWS – Field Delineation & Reporting (Missoula, MT): Mr. Colescott is a Professional Wetland Scientist that has more than 25 years of wetland and wildlife project experience. He has conducted over 100 wetland delineations; surveyed for state- and federally-listed wildlife and plants; assessed potential impacts to Waters of the U.S.; developed avoidance and minimization strategies; designed, implemented, and monitored wetland mitigation for unavoidable impacts; prepared General and Individual Clean Water Act Dredge and Fill permit applications, and served as the voice for both applicant and agency to assure complete project understanding and regulatory compliance. Julian assisted with wetland delineation, reporting, and mitigation planning for P4's nearby Caldwell Canyon Project.

Doug Rogness, PG – Project Manager & Quality Control (Helena, MT): Mr. Rogness is a principal and senior hydrologist/hydrogeologist with 35 years of experience in a variety of environmental projects. He has managed several projects that involved wetland delineation, impacts to wetlands, and developing wetland mitigation plans, including the nearby Caldwell Canyon Project. He will be the NewFields Project Manager for this Ballard Mine project, as well as provide quality control and logistical support for the project.

Sally Staley – Graphics (Helena, MT): Ms. Staley is the Graphics/GIS/CADD manager for the NewFields Montana offices. She has experience in geographic information systems (GIS) using ArcGIS, ArcInfo, Autodesk Map, ArcIMS, ArcGIS Server and Global Positioning Systems (GPS); programming and scripting using Visual Basic, HTML, Javascript, SQL, C, C++ and Python; production of drawings and diagrams, graphs, charts and technical schematics, computer-aided design and drafting (CADD) using ArcGIS and Autodesk Map. Sally completed all graphics work for wetland delineations and reporting for P4's nearby Caldwell Canyon Project.

4.0 REFERENCES

Environmental Laboratory, 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station.

U.S. Army Corps of Engineers (COE), 2008. Regulatory Guidance Letter, No. 08-02. Subject: Jurisdiction Determinations. 26 June 2008.

_____, 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). ERDC/EL TR-10-3. May 2010.

U. S. Fish and Wildlife Service (USFWS). 1988. National list of plant species that occur in wetlands: Northwest (Region 9). In cooperation with National and Regional Interagency Review Panels. Biological Report 88 (26.9) National Ecology Research Center, St. Petersburg, Florida.